CLAIMS

1. A transmission system in which the shaft of a combustion engine is coupled via a transmission device using flexible links, particularly of the belt type, to a shaft of an alternator-starter, characterized in that it has a two-state coupling device, the states being a first state corresponding to a phase for starting the engine, in which the shaft (1) of the alternator-starter (ATD) drives the crankshaft (V) of the engine (M) with a first transmission ratio, and a second state in which the crankshaft (V) of the engine (M) drives the shaft (1) of the alternator-starter (ATD) with a second transmission ratio, and in that the first transmission ratio is higher than the second transmission ratio.

2. The transmission system as claimed in claim 1, characterized in that the coupling device comprises a means of detecting the direction of the driving torque so as to place the coupling device in its first or second state selectively.

3. The transmission system as claimed in one of claims 1 and 2, characterized in that it has a first (2) and a second (3) pulley coaxial with said shaft (1), in that the transmission device has a first (4) and a second (5) flexible link, particularly a belt collaborating with the first (2) and second (3) pulleys respectively and mounted in such a way as to afford said first and second transmission ratios, and in that, when the coupling device is in the first state, the first pulley (2) is coupled to the shaft (1) of the alternator-starter (ATD) to afford said first transmission ratio and, when the coupling device is in the second state, the second pulley (3) is

coupled to the shaft (1) of the alternator-starter (ATD) to afford said second transmission ratio.

4. The system as claimed in claim 3, characterized in that the coupling device comprises a means placing the coupling device in its second state when the angular velocity (ω1) of the shaft (1) drops below the angular velocity (ω3) of the second pulley (3).

5. The system as claimed in one of claims 3 and 4, characterized in that the first pulley (2) has a diameter smaller than that of the second pulley (3).

6. The system as claimed in one of claims 3 to 5, characterized in that the first (4) and second (5) flexible links are mounted between, respectively, the first (2) and second (3) pulleys and the grooves of a pulley (30) fastened to the crankshaft (V) of the engine (M).

7. The system as claimed in one of claims 3 to 5, characterized in that the first flexible link (4) is mounted between the first pulley (2) and a first groove (23_1) of a double intermediate pulley (23) the second groove (23_2) of which receives the second flexible link (5) mounted between the second pulley (3) and a groove of a pulley (30) fastened to the crankshaft (V) of the engine (M).

8. The system as claimed in claim 7, characterized in that said first groove (23_1) has a diameter greater than that of said second groove (23_2).

9. The system as claimed in one of claims 7 and 8, characterized in that it comprises a tensioning element (7) arranged on a strand part of the

second flexible link (5) between the intermediate pulley (23) and the second pulley (3).

10. The system as claimed in one of claims 3 to 9, characterized in that the coupling device comprises a first (41) and a second (42) power transmission device, which can be unfastened, which are mounted in opposition, the first (41) between the shaft (1) or continuation thereof and the first pulley (2), and the second between the shaft (1) or continuation thereof and the second pulley (3) and fastening or unfastening the shaft (1) and the corresponding pulley (2, 3) according to their relative angular velocities.

11. The system as claimed in claim 10, characterized in that said unfastenable transmission devices comprise a free wheel, the two free wheels (41, 42) being mounted in opposite directions.

12. The system as claimed in one of claims 3 to 9, characterized in that the coupling device is arranged between the first (2) and the second (3) pulleys and comprises at least one coupling element (10) that can be moved longitudinally parallel to the axis of said shaft between two positions corresponding to the first and second coupling states respectively.

13. The system as claimed in claim 12, characterized in that said longitudinally movable coupling element comprises a selector (10) exhibiting a first helical connection (12), particularly a screw thread or a helical cam path collaborating with a complementary secondary helical connection (12) fastened to the shaft (1) of the alternator-starter (ATD) and at least a lateral face (10', 10") bearing a power transmission element (15, 16), particularly a friction lining or a dog, and

facing a flank (2', 3') of one of the first (2) and second (3) pulleys.

14. The system as claimed in claim 13, characterized in that the selector (10) has a first lateral face (10') facing a flank (2') of the first pulley (2) and bearing a first power transmission element (15), and a second lateral face (10") bearing a control element (11) able to move in translation parallel to the axis of said shaft (1) and having an end face facing towards a flank (3') of the second pulley (3) and bearing a second power transmission element (16) consisting of a friction lining, and in that the selector (10) bears at least one elastic return element (14), such as a spring, which exerts a pressing force on the control element (11) so that said friction lining (16) presses against said flank (3') of the second (3) pulley.

15. The system as claimed in claim 13, characterized in that the selector (10) has a first (10') and a second (10") lateral face facing a flank (2', 3') of the first (2) and second (3) pulleys respectively and which bear power elements (15, 16), and in that it has a control element (11) able to move in longitudinal translation with respect to the selector (10) parallel to the axis of said shaft (1, 1'), the control element (11) having a lateral face (11') facing towards a flank (3') of the second pulley (3) and bearing a friction lining (18), and in that the selector (10) bears an elastic return element (14), such as a spring, which exerts a pressing force on the control element (11) so that said friction lining (18) of the control element (11) presses against said flank (3') of the second pulley (3).

16. The system as claimed in claim 13, characterized in that the selector has a first (10') and a second (10") lateral face bearing a power transmission element (15, 16) and facing a flank (2', 3') of the first (2) and second (3) pulleys respectively, and in that it has a control element (11) rotating as one with the selector (10) and which, for any longitudinal position of the selector, generates a torque which is dependent on the relative angular displacement between the selector (10) and at least one of the first (2) and second (3) pulleys.

17. The system as claimed in claim 16, characterized in that the control element (11) has an elastically deformable element (18) which, at its longitudinal ends, has deformable regions (19, 19') which are in contact with said flank (2') of the first pulley (2) and said flank (3') of the second pulley (3), respectively, at least when the selector (10) is in one longitudinal position.

18. The system as claimed in claim 16, characterized in that the control element (11) has, on at least one lateral face, a magnetic element (22, 22') facing a complementary magnetic element (20, 20') borne by said flank (2', 3') of one of the first (2) and second (3) pulleys.

19. The system as claimed in claim 16, characterized in that the selector (10) has, on two opposite lateral faces (10', 10"), a power transmission element (15, 16), one of them (15) facing a flank (2') of the first pulley (2), and the other (16) facing a flank (3') of the second pulley (3) and in that the selector (10) has an annular magnetic element (22) arranged at its periphery and situated facing a complementary annular magnetic element (20) fastened to the second pulley (3).

20. The system as claimed in claim 16, characterized in that the selector (10) has a friction element (18), particularly a deformable one, which is situated at its periphery and is in contact with an annular region (19") of the second pulley (3).

21. The system as claimed in claim 13, characterized in that the selector (10) has a first (10') and a second (10") lateral face bearing a power transmission element (15, 16) and facing a flank (2', 3') of the first (2) and second (3) pulleys respectively, and in that it has a control element (11) able to move in translation with respect to the selector (10) and having, on at least one lateral face (11', 11"), a magnetic element (22', 22") facing a complementary magnetic element (20, 20') borne by a flank (2', 3') of one of the first (2) and second (3) pulleys.

22. A device as claimed in one of claims 7 to 9, characterized in that the coupling device comprises a first and a second power transmission device that can be unfastened and that are mounted to act in opposition, the first being mounted coaxially with the first pulley (2) and the second being mounted coaxially with the double intermediate pulley (23).

23. The device as claimed in claim 22, characterized in that said first and second unfastenable transmission devices have helical connections operating in opposite directions in order to cause said first and second devices to operate in opposite directions.

24. The device as claimed in claim 22, characterized in that said first and second unfastenable transmission devices comprise a free wheel.